

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 20 JAN 2006
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Applicant's or agent's file reference MOL0678	FOR FURTHER ACTION		See Form PCT/APEA/416
International application No. PCT/B2005/000299	International filing date (day/month/year) 07.01.2005	Priority date (day/month/year) 09.01.2004	
International Patent Classification (IPC) or national classification and IPC C04B35/00			
Applicant MOLTECH INVENT S.A. et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> <i>(sent to the applicant and to the International Bureau) a total of five sheets, as follows:</i></p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. <p>b. <input type="checkbox"/> <i>(sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</i></p> <p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Box No. I Basis of the opinion <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application 			
Date of submission of the demand 10.10.2005	Date of completion of this report 19.01.2006		
Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Vathilakis, S Telephone No. +49 89 2399-8585		



**INTERNATIONAL PRELIMINARY REPORT
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International application No.
PCT/IB2005/000299

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
 - international search (under Rules 12.3 and 23.1(b))
 - publication of the international application (under Rule 12.4)
 - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements* of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-22 as originally filed

Claims, Numbers

1-37 received on 12.10.2005 with letter of 10.10.2005

Drawings, Sheets

1/5-5/5 as originally filed

a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. The amendments have resulted in the cancellation of:

- the description, pages
- the claims, Nos.
- the drawings, sheets/figs
- the sequence listing (*specify*):
- any table(s) related to sequence listing (*specify*):

4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- the description, pages
- the claims, Nos.
- the drawings, sheets/figs
- the sequence listing (*specify*):
- any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-37
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-37
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-37
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

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Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

Claims 1 and 8 and the remaining claims 2-7 and 9-37 have novelty and meet the criteria of inventive step under PCT Article 33 (2-3) because the prior art cited in the International Search Report does not teach or suggest to form a ceramic material upon providing a porous sintered mass and impregnating the open microporosity of this sintered mass with colloidal and/or polymeric iron (oxide) based particles that form upon heat treatment agglomerates in the pores.

The infiltration process of iron (oxide) into the surface has two consequences, namely a) filling the surface porosity of the sintered structural ceramic mass with iron (oxide) so as to reduce/eliminate the permeability of the surface and b) providing a graded concentration of iron (oxide) agglomerates in the structural mass, namely a high concentration at the surface and a decreasing concentration below the surface.

Reference is made to the following documents of the International Search Report:

- D1: WO 03/078695 A (MOLTECH INVENT S.A; NGUYEN; THINH, T; DE NORA, VITTORIO) 25 September 2003 (2003-09-25)
- D2: WO 01/42168 A (MOLTECH INVENT S.A; DE NORA, VITTORIO; DURUZ, JEAN-JACQUES) 14 June 2001 (2001-06-14)
- D3: WO 2004/024994 A (MOLTECH INVENT S.A; NGUYEN, THINH, T; DE NORA, VITTORIO) 25 March 2004 (2004-03-25)
- D4: US-B1-6 361 681 (DE NORA VITTORIO ET AL) 26 March 2002 (2002-03-26)
- D5: US-B1-6 425 992 (DE NORA VITTORIO) 30 July 2002 (2002-07-30)
- D6: EP-A-1 508 762 (MOLTECH INVENT S.A) 23 February 2005 (2005-02-23)
- D7: WO 01/42531 A (MOLTECH INVENT S.A; NGUYEN, THINH, T; DURUZ, JEAN-JACQUES; DE NORA, VI) 14 June 2001 (2001-06-14)

Document D1 is regarded as being the closest prior art to the subject-matter of claim 1 and teaches in example 3 to mix Fe₂O₃ particles with TiO₂ particles and colloidal alumina particles so as to form a mixture which is then applied as a coating onto an anode which is then sintered.

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It follows that D1 neither discloses claim 1's method for impregnating with polymeric/colloidal iron in microporous sintered ceramic material nor the resulting ceramic material as set out in claim 8.

Similar observations apply in view of D2 - D7. Neither D2 nor D3, D4, D5, D6 or D7 disclose claim 1's method of impregnating with polymeric/colloidal iron (oxide) in microporous sintered ceramic material nor the resulting ceramic material as set out in claim 8. Hence claims 1 and 8 are considered to be novel over the prior art D1 to D7; Article 33(2) PCT.

Said Infiltration/impregnation with colloidal/polymeric iron oxide clogs the pores at the surface of the microporous ceramic material and inhibits oxygen diffusion and promotes aluminium wetting by reaction with molten aluminium when exposed thereto and is not obvious in the light of the cited prior art.

Patentability of claims 1 and 8 support patentability of the remaining claims 2-7 and 9-37. The invention of claims 1-37 is, therefore, novel and is considered to involve an inventive step with respect to the available prior art documents, and is further considered to be industrially applicable.

Re Item VIII

Certain observations on the international application

The description (page 3 to page 9) has not been adapted to the current amended claims. Thus for example, page 8, lines 24-32 refer to a method that corresponds to former claim 31 but is not in accordance with present claim 1. This inconsistency gives rise to clarity objections (Art. 6 PCT) when using the description to interpret the claims. This defect could have been avoided upon adapting the description into line with the present set of claims.